

present amendment applicants have reworded all claims where ambiguities might exist, and have ensured that the examiner's particular objections have been addressed. As a result, it is now clear what the individual weight percentages are based upon. Moreover, in answer to the examiner's particular question, A2 comprises at least one graft shell, as is clear from the language in claim 1 "...the graft A2 comprising at least one graft shell...", in light of the antecedent basis therefor in the instant specification on page 11, lines 15-19. Moreover, the examiner's suggestions concerning components A21 and b1 in claim 1 have been followed exactly, and applicants have reworded all of the claims to remove constructions such as "a component C, wherein component C comprises". Claim 3, which was objected to, has been canceled. Claim 4 has been amended exactly as suggested by the examiner. However, with regard to the examiner's general assertion that the number and letter designations for components of the invention "make the claims read awkwardly", applicants maintain that such designations are needed for a clear understanding of the invention, and that such designations actually serve to enhance the reader's comprehension. Following the examiner's suggestion, applicants have amended claim 1 to particularly recite a substrate layer. It is therefore requested that the examiner's objections to the claims be withdrawn.

3. Claims 1, 2, 5 and 8 have been rejected under 35 USC 112, second paragraph, as being indefinite. In response to the examiner's particular rejections, applicants have:

(a) Removed the dashes from claim 1. The limitations in this claim are now completely

clear.

- (b) Rewritten claim 2 making it clear that interlayer (2) has a composition which is different from the composition of top layer (3) and is different from the composition of substrate layer (1). Thus, in every case the layers (1), (2) and (3) are different from each other. As particularly recited, interlayer (2) may comprise impact-modified polymethyl methacrylate, polycarbonate, or acrylate/styrene/acrylonitrile (ASA). Additionally, applicants have ensured that there is appropriate antecedent basis for all limitations in claim 2.

- (c) Rewritten claim 5 to ensure that "layer (1)" and not "component (1)" is recited.

Furthermore, this claim has been rewritten to make it clear that the substrate layer (1') comprises a polyamide or blends of a polyamide with ABS, and that the substrate layer (1') always has a thickness of 90-990 microns. Additionally, claim 5 has been rewritten to make it clear that the substrate layer (1') comprises special-effect colorants if the substrate layer (1') and the top layer (3') are composed of the same materials. Finally, "them" and "same molding compounds" have been removed from claim 5 in the rewriting thereof. Proper antecedents for all limitations are now present throughout.

In his rejection of claim 8 under 35 USC 112, second paragraph, the examiner has asked: "Do the layers, once formed, have the claimed MFI ratio?" Applicants affirm that the layers once formed have the claimed MFI ratios.

Additionally, applicants have amended claim 17 to clearly recite a molding

comprising a shaped laminated sheet or film as claimed in claim 1, which is backsprayed or back-cast with component (1) of claim 1 or with a polyurethane foam, or which is laminated onto a molding comprising layer (1) of claims 1 or a polyurethane foam.

Finally, applicants have added new claim 21, which recites a shaped laminated sheet or film as claimed in claim 2, which is backsprayed or back-cast with layer (1) as set forth in claim 2 or with a polyurethane foam. New claims 22 and 23 are directed to the moldings of claims 16 and 17, respectively, which are in the form of exterior bodywork components.

Applicants assert that as a result of the amendments and new claim submissions herein, all claims in this case are now in complete compliance with 35 USC 112, second paragraph. It is therefore requested that the rejections of the instant claims under 35 USC 112, second paragraph, be withdrawn.

4. Claim 3 has been rejected under 35 USC 102(b) as being anticipated by DeWitt, U.S. 4,107,235. Claim 3 has been canceled.

5. Claims 3, 5, and 17 have been rejected under 35 USC 102(b) as being anticipated by Ellison, Re. 35,894. Claim 3 has been canceled. Claim 5 is directed to a laminated film comprising a substrate layer comprising a polyamide or blends of a polyamide with ABS, and a transparent top layer comprising polymethyl methacrylate, high-impact polymethyl methacrylate or polyamide, the substrate layer comprising special-effect colorants if the substrate layer and the top layer are composed of the same materials. As Ellison does not

disclose the employment of special-effect colorants if the substrate layer and the top (or coating) layer are composed of the same materials, instant claim 5 does not read on the disclosure of Ellison. With regard to claim 17, this claim is directed to a shaped laminated sheet or film as defined in claim 1, which is backsprayed or back-cast with layer (1) of claim 1 or with a polyurethane foam. Accordingly, this shaped laminated sheet or film requires an ASA or ASA/polycarbonate substrate layer, which is not found in Ellison. Therefore claim 17 does not read on the disclosure of Ellison. It is therefore requested that the rejection of claims 5 and 17 as being anticipated by Ellison under 35 USC 102(b) be withdrawn.

6. Claims 1, 3-8, 15, 16 and 18 have been rejected under 35 USC 103(d) as being unpatentable over Ellison, *supra*, in view of Fischer, U.S. 5,747,568. The examiner acknowledges that Ellison does not teach that the substrate layer may comprise the claimed composition. However, the examiner asserts that it would have been obvious to the skilled artisan to utilize Fischer's composition as the substrate of the laminate taught in Ellison, because Ellison teaches the employment of polymers suitable for automotive parts as his substrate, and Fischer's composition may be used in the construction of automotive parts.

The instantly claimed invention relates to laminated sheets or films having an ASA or ASA/polycarbonate substrate-layer and a transparent top layer of polymethyl methacrylate. Between those two layers may be located an interlayer. These laminated

sheets or films are usually employed for forming moldings, especially in the form of an automotive exterior body work component. For producing these moldings the laminated sheets or films are backmolded or back-cast with a polymer-material forming the major part of the molding. This material is ASA, ASA/polycarbonate-blend or a polyurethane foam. The laminated sheets or films according to the present invention as claimed help to provide for a surface finish of the moldings which is superior to painted moldings. In contrast to a painting process no wet paint has to be applied to the molding.

The specific combination of ASA or ASA/polycarbonate substrate-layer and PMMA top layer leads to specific advantages of the claimed laminated sheets or films. The advantages, especially in relation to moldings in which an ABS substrate-layer is used are listed on pages 31 and 32 of the present specification. Examples are:

- lower loss in toughness due to PMMA top layer when the ASA or ASA/polycarbonate substrate-layer is used, in comparison to the ABS-substrate;
- increased scratch resistance of the PMMA layer, which is also governed by the substrate layer lying below the top layer;
- effective prevention of the formation of cracks in the PMMA top layer as a result of the toughened interlayer and/or toughened substrate layer, even after heat aging;
- thinner PMMA top layers can be used without reducing the UV-stability of the substrate layer, even after high degree of deepdrawing;
- the claimed moldings have very good properties in respect of low-temperature

- impacts, elongation at break, scratch resistance and surface gloss;
- the claimed laminated sheets or films can be thermoformed with retention of gloss even at very high draw ratios (especially in the positive thermoforming process) after artificial weathering;
- moldings comprising polycarbonates in the substrate layer are highly resistant to a thermal deformation and are particularly impact resistant.

Ellison relates to injection molded plastic articles with an integral weatherable pigmented film surface. The articles are made by placing a preformed decorative surfacing film into a mold. A moldable polymer is then introduced into the mold on one side of the surfacing film. The decorative surfacing film includes a bonding layer formed of the thermoplastic thermoformable polymer, different from the cast film. See col. 2, lines 41-56. The weatherable cast film may be, among others, PMMA. See col. 4, line 47.

The bonding layer comprises a preformed film of a thermoplastic polymer laminated to the inner surface of the cast film. The bonding layer may be a fusible olefin of an acrylic adhesive or a polyester isocyanate adhesive. See col. 5, lines 50-65. The bonding layer serves as a reinforcement to facilitate handling of the decorative surfacing film, placement of the film into the mold, and also ensures that it remains wrinkle free in the mold during the molding operation. See col. 6, lines 5-9.

The film may for example consist of a weatherable fluoropolymer film, an acrylic adhesive film and a PVC substrate film. This laminated film may be employed in PVC

moldings, see example 1 and col. 5, lines 62-65.

According to example 4 the cast film is bonded to an ABS bonding film, and ABS is used as the injection-molding polymer. In sharp contrast, the laminated sheets or films according to the present invention as claimed have an ASA or ASA/polycarbonate substrate layer. The use of this substrate layer in combination with a PMMA top layer leads to the specific advantages of the present invention which are nowhere suggested in Ellison. This is evident from the examples of the present application, which are consulted to understand the present invention as a whole.

The results listed in table 1 show the change in the penetration energy as a result of PMMA layers. A substrate is coated on one side with a PMMA layer, and the penetration energy is measured for the top face and the rear face. For systems including PMMA and ASA substrates, the penetration energy for the top face is much higher than the penetration energy for the rear face. On the contrary, for the system PMMA/ABS the penetration energy is approximately the same.

Nothing the listing of suitable polymer substrates in col. 5, lines 33-49 of Ellison, there is no suggestion in this reference that exchanging an ABS substrate for an ASA substrate could lead to such an astonishing increase in penetration energy. Such results are indeed unexpected in view of Ellison.

Furthermore, the low-temperature impact strength is much higher for PMMA/ASA-systems as compared with PMMA/ABS-systems. See the results in instant table 2.

Moreover, the provision of an interlayer increases the penetration energy to a large extent. Similar results are obtained for the elongation at break. See instant table 3. The values obtained for PMMA/ASA/ASA-polycarbonate-blends are twice the values obtained form PMMA/ABS.

Furthermore, the films according to the present invention have a significantly higher deepdraw ratio as compared with the films taught by Ellison. According to the present invention, a laminated sheet or film comprising an ASA substrate shows a significant improvement in mechanical properties, which could not be predicted from the prior art, especially PMMA/ABS-systems. The PMMA/ABS-system is the closest prior art as suggested by Ellison.

Fischer relates to a thermoplastic molding material consisting of an alkyl acrylate grafting base, a SAN-graft, a SAN-matrix and tocopherol and thiodipropionic esters as additives. It is disclosed that this material may be used for forming automotive parts. However, there is no teaching or suggestion in Fischer that this material may be formed into laminated sheets, especially those having a PMMA top layer. Fischer as a whole relates to the use of the described ASA polymer for forming the bulk material of automotive parts, and not a laminated sheet or film which could be used in connection with backspraying or back-casting with an ASA polymer or in connection with laminating the laminated sheet or film onto a molding of this ASA polymer. There is therefore no real evidence in the form of a definitive teaching in Fischer which would motivate the skilled

artisan to modify what is disclosed in the art and produce the present invention as claimed as there is no real expectation of obtaining beneficial results in an altogether different application. Because the prior art does not contain sufficient teaching of how to obtain the results desired by applicants, or indicate that such desired results would be obtainable if certain directions were pursued, an "obvious to try" situation at best exists. *In re Eli Lilly & Co.*, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990). This is clearly not the standard for obviousness under 35 USC 103(a). *Ex parte Erlich*, 3 USPQ2d 1011 (BPAI 1986); *In re Geiger*, 2 USPQ2d 1276 (Fed. Cir. 1987). It is therefore requested that the rejection of claims 1, 4-5, 7-8, 15, 16 and 18 under 35 USC 103(a) based on Ellison in view of Fischer be withdrawn, and that new claims 21-23 be allowed.

7. Claim 19 has been rejected under 35 USC 103(a) as being unpatentable over Ellison in view of Fischer, as applied to claims 1, 4-5, 7-8, 15, 16 and 18 above, and further in view of Ogura, US 5,773,139. The examiner asserts that it would have been obvious to apply a protective film to the outside of the laminate taught in Ellison to prevent shattering of the polymethyl methacrylate layer. Ogura relates to an impact resistant transparent resin laminate having at least one methacrylate resin plate and at least one polycarbonate resin plate which are bonded with a bisphenol type epoxy resin base soft polymer. It is stated that to prevent flying of fractured pieces of the laminate when the impact is given to the laminate, a film of, for example, a polycarbonate or polyethylene terephthalate may be adhered to the surface or surfaces of the laminate. See col. 6, lines

15-18. However, this reference does not disclose PMMA/ASA-systems. Instead, an PMMA/interlayer/polycarbonate-system is disclosed. Accordingly, Ogura does not supply what is lacking in the combination of Ellison and Fischer as discussed immediately above. That is to say, the combined teachings of Ogura with Ellison and Fischer do not motivate one of skill in the art to make the invention of claim 19, which has all of the limitations of claim 1 on which it depends. Otherwise said, the combination of the teachings of Ogura, Ellison and Fischer, when taken as a whole, do not teach or suggest the employment of a laminated sheet or film comprising an ASA polymer and a polymethyl methacrylate top layer with the expectation of achieving the advantageous mechanical properties shown in the examples. Applicants therefore request that the rejection of claim 19 under 35 USC 103(a) be withdrawn.

CONCLUSION

Based on the above amendment and remarks, applicants submit that the present application is in condition for allowance. Early action to this end is requested.

A check in the amount of \$110.00 is attached to cover the required one month extension of time fee.

To the extent necessary, applicant(s) petition for an Extension of Time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit

GREFENSTEIN et al., Serial No. 08/987,775



any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF

A handwritten signature in black ink, appearing to read "George F. Helfrich".

George F. Helfrich
Reg. No. 22,350

1101 Connecticut Ave., N.W.
Washington, D.C. 20036
(202)659-0100

GFH/kas

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